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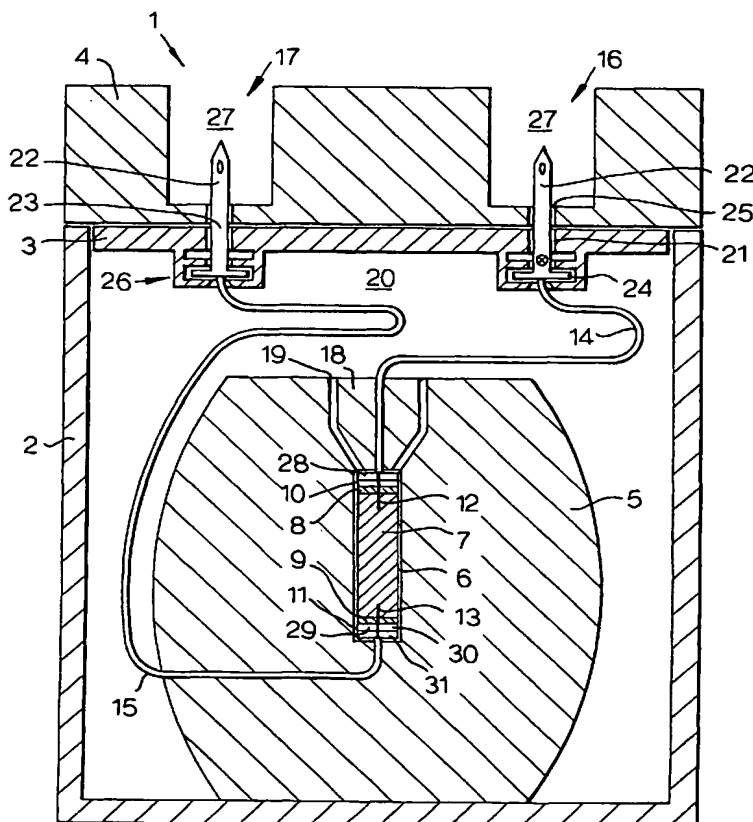
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(54) Title: RADIOISOTOPE GENERATOR AND METHOD OF CONSTRUCTION THEREOF



(57) Abstract: A device for producing a fluid containing a radioactive constituent, comprising a shielded chamber (5) with an opening for receiving an isotope container (6) housing a radioactive isotope (7); a chamber closure (18) adapted for cooperating with and closing the chamber opening; a first fluid port comprising a first hollow needle projecting into the shielded chamber from the chamber closure for fluid communication with the isotope container; a second fluid port comprising a second hollow needle projecting into the shielded chamber from the closed end of the chamber opposite the chamber closure for fluid communication with the isotope container; first and second compressible buffers (28, 29) mounted so as to surround at least partially the respective first and second hollow needles (12, 13), each buffer providing an outer surface for contact with opposed ends of the isotope container; and a spacer of a predetermined thickness associated with one or each of the first and second compressible buffers for determining the positioning of the isotope container within the shielded chamber.



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B. FIELDS SEARCHED

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, PAJ, EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 041 587 A (COMMISSARIAT À L'ÉNERGIE ATOMIQUE) 29 January 1971 (1971-01-29) the whole document	1,2,6-9, 14
A	US 3 655 981 A (MONTGOMERY JAMES R ET AL) 11 April 1972 (1972-04-11) column 2, line 48 -column 6, line 61; figures 1-6	1,6-9, 14-17
A	FR 2 194 021 A (HOECHST AG) 22 February 1974 (1974-02-22) page 3, line 36 -page 6, line 1; figure 2	1,2,6,8, 9,11-14
A	US 3 535 085 A (SHUMATE DONALD J) 20 October 1970 (1970-10-20) the whole document	1,2,6,8, 14
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3 564 256 A (NONHEBEL DIRK ET AL) 16 February 1971 (1971-02-16) cited in the application the whole document -----	1,2,6,8, 14

INTERNATIONAL SEARCH REPORT

Internal Application No
PCT/GB 02/05604

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2041587	A	29-01-1971	FR 2041587 A5	29-01-1971
US 3655981	A	11-04-1972	DE 1959586 A1	03-02-1972
			GB 1283754 A	02-08-1972
			JP 52009279 B	15-03-1977
			JP 49028879 B	30-07-1974
			NL 6917881 A	02-06-1970
FR 2194021	A	22-02-1974	DE 2236565 A1	07-02-1974
			AT 335578 B	25-03-1977
			AT 650473 A	15-07-1976
			AU 469264 B2	05-02-1976
			AU 5840673 A	23-01-1975
			BE 802839 A1	28-01-1974
			CH 559959 A5	14-03-1975
			DD 105392 A5	20-04-1974
			ES 417087 A1	16-03-1976
			ES 417088 A1	16-03-1976
			FR 2194021 A1	22-02-1974
			GB 1428669 A	17-03-1976
			IL 42812 A	31-03-1976
			IT 992668 B	30-09-1975
			JP 49057298 A	04-06-1974
			NL 7310153 A	29-01-1974
			SU 479307 A3	30-07-1975
			US 3898044 A	05-08-1975
			ZA 7304837 A	26-06-1974
US 3535085	A	20-10-1970	DE 1769289 A1	02-03-1972
			JP 49028319 B	25-07-1974
US 3564256	A	16-02-1971	NL 6607699 A	04-12-1967
			BE 699446 A	04-12-1967
			DE 1566539 A1	30-04-1970
			DK 117913 B	15-06-1970
			FI 47266 B	31-07-1973
			FR 1583657 A	28-11-1969
			GB 1186587 A	02-04-1970
			NO 123969 B	07-02-1972
			SE 344278 B	10-04-1972